

Final Report  
of the  
Small Business Advocacy Review Panel  
on EPA's Planned Proposed Rule

Greenhouse Gas Emissions and Fuel  
Efficiency Standards for Medium- and  
Heavy-Duty Engines and Vehicles: Phase 2

January 15, 2015

# TABLE OF CONTENTS

1	Introduction.....	1
2	Background.....	2
	2.1 Background and Regulatory History.....	2
	2.2 Description of the Rule and its Scope .....	3
	2.3 Related Federal Rules.....	4
3	Overview of Proposal Under Consideration .....	6
	3.1 Potential Requirements and Guidelines of the Proposal .....	6
	3.1.1 Engines .....	6
	3.1.2 Tractors.....	6
	3.1.3 Vocational Vehicle Chassis.....	7
	3.1.4 Complete Pickup Trucks and Vans .....	7
	3.1.5 Trailers .....	7
4	Applicable Small Entity Definitions.....	8
5	Small Entities that May Be Subject to the Proposed Regulation.....	8
6	Summary of Small entity Outreach.....	9
	6.1 Pre-Panel Outreach Meeting with Potential Small Entity Representatives .....	10
	6.1.1 Pre-Panel Outreach Meeting Summary.....	11
	6.2 SBAR Panel Outreach to Small Entity Representatives .....	12
	6.2.1 Trailer Manufacturers.....	12
	6.2.2 Alternative Fuel Engine Converters .....	15
	6.2.3 Vocational Vehicle Chassis Manufacturers .....	16
7	List of Small Entity Representatives.....	17
8	Summary of Comments from Small Entity Representatives .....	18
	8.1 Summary of Written Comments Following Pre-Panel Outreach Meeting .....	18
	8.1.1 Trailer Manufacturers.....	18
	8.1.2 Vocational Vehicle Chassis Manufacturers .....	20
	8.1.3 Alternative Fuel Engine Manufacturers .....	20
	8.2 Summary of Written Comments following Panel Outreach Meeting .....	22

8.2.1	Trailer Manufacturers.....	22
8.2.2	Alternative Fuel Engine Converters.....	28
8.2.3	Vocational Chassis Manufacturers.....	33
8.2.4	Potential Reporting, Recordkeeping and Compliance Burdens.....	34
8.2.5	Suggested Flexibilities.....	34
9	Panel Findings and Discussion.....	35
9.1	Number and Types of Entities Affected.....	35
9.2	General Potential Reporting, Recordkeeping and Compliance Burdens.....	35
9.3	Trailers.....	35
9.3.1	Feasibility of Proposed Technologies.....	35
9.3.2	Potential Reporting, Recordkeeping and Compliance Burdens.....	36
9.3.3	Suggested Flexibilities.....	37
9.4	Alternative Fuel Engine Converters.....	39
9.4.1	Feasibility of Proposed Technologies.....	39
9.4.2	Potential Reporting, Recordkeeping and Compliance Burdens.....	40
9.4.3	Suggested Flexibilities.....	40
9.5	Vocational Chassis Manufacturers.....	41
9.5.1	Feasibility of Proposed Technologies.....	41
9.5.2	Potential Reporting, Recordkeeping and Compliance Burdens.....	41
9.5.3	Suggested Flexibilities.....	41
	Appendix A.....	A1
	Appendix B.....	B1

# 1 INTRODUCTION

This report is presented by the Small Business Advocacy Review Panel (SBAR Panel or Panel) convened for the proposed rulemaking “Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles: Phase 2” (or “Phase 2”) that is currently being developed by the U.S. Environmental Protection Agency (EPA). Under section 609(b) of the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), EPA must convene a Panel prior to publication of the initial regulatory flexibility analysis (IRFA) that the agency may be required to prepare under the RFA. In addition to EPA’s Small Business Advocacy Chairperson, this particular Panel consists of the Director of the Assessment and Standards Division of the EPA Office of Transportation and Air Quality, the Administrator of the Office of Information and Regulatory Affairs within the Office of Management and Budget, and the Chief Counsel for Advocacy of the Small Business Administration.

This report includes the following:

- Background information on the proposed rule being developed;
- Information on the types of small entities that would be subject to the proposed rule;
- A description of efforts made to obtain the advice and recommendations of representatives of those small entities; and
- A summary of the comments that have been received to date from those representatives.

Section 609(b) of the RFA directs the Panel to report on the comments of small entity representatives and make findings on issues related to elements of an IRFA under section 603 of the RFA. Those elements of an IRFA are:

- A description of, and where feasible, an estimate of the number of small entities to which the proposed rule will apply;
- A description of projected reporting, record keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule;
- A description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. This analysis shall discuss any significant alternatives such as:
  - the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
  - the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
  - the use of performance rather than design standards; and

- an exemption from coverage of the rule, or any part thereof, for such small entities.

Once completed, the Panel Report is submitted to the EPA Administrator and is included in the rulemaking record. EPA considers the Panel's findings when completing the draft of the proposed rule. In light of the Panel Report, and where appropriate, EPA also considers whether changes are needed to the IRFA for the proposed rule or the decision on whether an IRFA is required.

The Panel's findings and discussion are based on the information available at the time the final Panel Report is drafted. EPA will continue to conduct analyses relevant to the proposed rule, and additional information may be developed or obtained during the remainder of the rule development process.

Any options identified by the Panel for reducing the rule's regulatory impact on small entities may require further analysis and/or data collection to ensure that the options are practicable, enforceable, environmentally sound, and consistent with the Clean Air Act (CAA) and its amendments.

## **2 BACKGROUND**

### **2.1 Background and Regulatory History**

Heavy-duty vehicles are classified as those with gross vehicle weight ratings (GVWR) of greater than 8,500 lb. Section 202(a) of the Clean Air Act (CAA) allows EPA to regulate new vehicles and new engines by prescribing emission standards for pollutants which the Administrator finds "may reasonably be anticipated to endanger public health or welfare." In 2009, EPA found that six greenhouse gases (GHGs) were anticipated to endanger public health or welfare, and new motor vehicles and new motor vehicle engines contribute to that pollution.

Acting under the authority of the CAA, EPA, in a joint rulemaking with National Highway Traffic Safety Administration (NHTSA), set the first phase of heavy-duty vehicle GHG standards (Phase 1) and specified certification requirements for emissions of four GHGs emitted by mobile sources: carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), and hydrofluorocarbons (HFC) in a final rule, "Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles," issued in September 2011. These rules marked the first greenhouse gas emissions (GHGs) and fuel efficiency standards for medium- and heavy-duty vehicles and engines, and together comprise a national program for fuel efficiency and GHG reductions for these vehicles and engines. The program addressed heavy-duty's increasing GHG contribution and fuel consumption increases through the adoption of performance-based standards that allowed manufacturers to determine the optimal mix of technologies to achieve the necessary reductions for their vehicle fleets and engines. The standards phase in from model year (MY) 2014 through MY 2018 (NHTSA's fuel efficiency standards being voluntary during the first two of the model years) and remain fixed beyond MY 2018 until the next phase of regulations adjust that standard. Manufacturers meeting the applicable small business criteria in 13 CFR 121.201 were not subject to the GHG emissions standards in Phase 1.

Due to the diversity of products in the heavy-duty vehicle/engines industries, the Phase 1 rule divided heavy-duty vehicles into three regulatory categories: heavy-duty pick-up trucks and vans (Class 2b and 3), vocational vehicle chassis (Class 2b – Class 8), and combination tractors (Class 7 and 8). In addition, the engines of the vocational vehicle chassis and combination tractors were regulated separately. Vocational body manufacturers, trailer manufacturers, fleet owners, and truck owner/operators were not regulated in Phase 1.

Class 2b and 3 pick-up trucks and vans weigh less than 14,000 lb GVWR and are sold by vehicle manufacturers as complete vehicles. Under Phase 1, these pick-up trucks and vans are certified by their manufacturers as complete vehicles using amended vehicle test procedures from EPA's existing program for emissions such as NO<sub>x</sub> and PM for these vehicles.

Vocational vehicles frequently begin as incomplete chassis that can be used for a number of vocational applications. Chassis manufacturers install engines and transmissions and sell the chassis to final stage body manufacturers who add appropriate features for the vehicles' final end-use (e.g., dump bed, delivery box, or utility bucket).

Combination tractor manufacturers build their own tractor chassis and bodies and install an engine and transmission. The engines are either the manufacturers' own or purchased from a separate engine manufacturer. The rule also created a new vehicle certification and compliance program for tractor manufacturers and vocational chassis manufacturers, which relies on a computer simulation of vehicle CO<sub>2</sub> emissions rather than emissions testing. EPA did not establish standards for new trailers and trailer manufacturers were not regulated in Phase 1.

The Phase 1 rule also required that engines used in heavy-duty vehicles greater than 14,000 lb GVWR be separately certified by their manufacturers to meet CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub> emissions standards using the same test procedures used to certify engines for other pollutants (NO<sub>x</sub>, PM, etc.). Phase 1 created separate GHG emissions standards for spark-ignition (traditionally gasoline-fueled) and compression-ignition (traditionally diesel-fueled) engines. Alternative fuel engine converters, who obtain incomplete engines and install fuel systems to allow the engine to run on alternative fuels, were required to meet the applicable engine standard based on the architecture of the base engine.

## **2.2 Description of the Rule and its Scope**

The Administration's 2013 Climate Action Plan instructed EPA and NHTSA to "once again partner with industry leaders and other key stakeholders to develop post-2018 fuel economy standards for heavy-duty vehicles." On February 18, 2014, the President further directed EPA and NHTSA to finalize these standards by March 31, 2016.

Similar to the Phase 1 rule, the proposed Phase 2 rule would significantly reduce GHG emissions associated with the transportation of goods across the United States post-2018. Phase 2 may include changes to existing engine and vehicle GHG standards, as well as regulatory standards and certification requirements for previously-unregulated new trailers pulled by semi-tractors. If such a rule is adopted, manufacturers of heavy-duty engines, chassis, vehicles and trailers could be

required to incorporate GHG-reducing and fuel-saving technologies. Many of these technologies are available in the marketplace already, but some may still be in development at this time.

Phase 2 will build upon the requirements in Phase 1 and could generally rely on the same basic certification and compliance structure. As part of the proposed rulemaking, EPA may consider increased stringency of engine and vehicle emissions standards based on engine and vehicle manufacturers' current projections of technology use, as well as EPA's own assessment of the penetration of existing emission-control technologies and potential for application of new, emerging technologies.

Manufacturers meeting the applicable small business criteria in 13 CFR 121.201 were not subject to the GHG emissions standards in Phase 1. EPA does not intend to extend such broad exemptions into Phase 2, but EPA may replace them with limited and targeted flexibilities. The recommendations outlined in this SBAR Panel Report will be used to identify and implement appropriate flexibilities for these small businesses.

### **2.3 Related Federal Rules**

The proposed Phase 2 rule under consideration builds on EPA's Phase 1 GHG and fuel efficiency rule (*Federal Register Vol. 76, p. 57106, September 15, 2011*). In addition, manufacturers are required to comply with all current standards set by EPA and other Federal and State agencies. EPA identified several standards related to the industries affected by this proposed rulemaking. These are listed in Table 1.

The Panel recognizes that there is the potential for a tension between technologies to improve fuel efficiency and some other Federal mandates, such as NHTSA safety regulations, EPA emissions standards for criteria pollutants, and EPA transportation fuel blending requirements for biofuels. EPA sought information from SERs on many of these tensions and flexibilities that could aid small businesses in complying with these multiple mandates and will continue to seek comment on them in the rulemaking development process. Nonetheless, it is the responsibility of the manufacturers to ensure that they continue to meet these requirements when adopting new technologies and strategies for the proposed Phase 2 rulemaking.

**Table 1: Federal and State regulations related to the industries impacted by this rulemaking**

Agency	Rule	Title
<b>EPA</b>	40 CFR 85	Control of Air Pollution from Mobile Sources
	40 CFR 86	Control of Air Pollution from New and In-Use Highway Vehicles and Engines
	40 CFR 600	Fuel Economy and Greenhouse Gas Exhaust Emission of Motor Vehicles
	40 CFR 1036	Control of Emissions from New and In-Use Heavy-Duty Highway Engines
	40 CFR 1037	Control of Emissions from New Heavy-Duty Motor Vehicles
	40 CFR 1039	Control of Emissions from New and In-Use NonRoad Compression-Ignition Engines
	40 CFR 1065	Engine-Testing Procedures
	40 CFR 1066	Vehicle Testing Procedures
	40 CFR 1068	General Compliance Provisions for Highway, Stationary, and Nonroad Programs
<b>California ARB</b>	AB 32	California Global Warming Solutions Act of 2006
<b>NHTSA</b>	49 CFR 523	Vehicle Classification
	49 CFR 534	Rights and Responsibilities of Manufacturers in the Context of Changes in Corporate Relationships
	49 CFR 535	Medium- and Heavy-Duty Vehicle Fuel Efficiency Program
	49 CFR 565	Vehicle Identification Number (VIN) Requirements
	49 CFR 566	Manufacturer Identification
	49 CFR 567	Certification
	49 CFR 568	Vehicles Manufactured in Two or More Stages
	49 CFR 569	Regrooved Tires
	49 CFR 573, 577, 579	Defect and Noncompliance
	49 CFR 574	Tire Identification and Recordkeeping
	49 CFR 575	Consumer Information
	49 CFR 576	Record Retention
	FMVSS 106	Brake Hoses
	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment
	FMVSS 119	New Pneumatic Tires for Vehicles Other Than Passenger Cars
	FMVSS 120	Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars
	FMVSS 121	Air Brake Systems
	FMVSS 223	Rear Impact Guards
	FMVSS 224	Rear Impact Protection
	FMVSS 303	Fuel System Integrity of Compressed Natural Gas Vehicles
FMVSS 304	Compressed Natural Gas Fuel Container Integrity	
<b>FHWA</b>	23 USC 127	Vehicle Weight Limitations – Interstate System
	23 CFR 657	Certification of Size and Weight Enforcement
	23 CFR 658	Truck Size and Weight, Route Designations – Length, Width and Weight Limitations

### **3 OVERVIEW OF PROPOSAL UNDER CONSIDERATION**

#### **3.1 Potential Requirements and Guidelines of the Proposal**

Building on the Phase 1 rule, this proposed Phase 2 rule will significantly reduce GHG emissions associated with the transportation of goods across the United States post-2018. The proposed Phase 2 rulemaking considers changes to existing engine and vehicle GHG standards, as well as regulatory standards and certification requirements for previously-unregulated new trailers pulled by semi-tractors. If such a rule is adopted, manufacturers of heavy-duty engines, chassis, vehicles and trailers could be required to incorporate GHG-reducing and fuel-saving technologies in order to comply with EPA's performance-based standards. The proposed Phase 2 standards would represent a more technology-forcing approach than the Phase 1 approach, effectively requiring manufacturers to apply both off-the-shelf technologies and potentially technologies still under development. Unlike the Phase 1 rulemaking, EPA is not proposing to exempt small businesses from the Phase 2 proposal.

##### **3.1.1 Engines**

EPA is proposing to continue the basic Phase 1 structure for the Phase 2 engine standards. There would be separate standards and test cycles for tractor engines, vocational diesel engines, and vocational gasoline engines, including a proposed revision to the test cycle for tractor engines to better reflect actual in-use operation. EPA is proposing more stringent standards for all on-highway diesel engines and gasoline engines used in pickup trucks and vans in the Class 2b and 3 weight categories. EPA is not planning to propose more stringent standards for gasoline engines used in vocational vehicles. In Phase 2, alternative fuel converters will continue to be subject to engine and vehicle standards for GHG emissions. Small business alternative fuel converters of new engines may also be required to report and/or certify their engines and vehicles meet the GHG standards in addition to criteria pollutants.

##### **3.1.2 Tractors**

EPA is proposing to largely continue the Phase 1 tractor program but to propose new standards. EPA projects that the proposed tractor standards could be met through improvements in the engine, transmission, driveline, aerodynamic design, lower rolling resistance tires, extended idle reduction technologies, and other accessories of the tractor. EPA's evaluation shows that some of these technologies are available today, but have very low adoption rates on current vehicles, while others will require some lead time for development. Similar to Phase 1, EPA is proposing to use the Greenhouse gas Emissions Model (GEM) vehicle simulation tool as the "test procedure" to certify the complete tractors. The proposed rule will include several updates to this model, including new vehicle categories, simulated test cycle improvements, and recognition of additional technologies. EPA is not aware of any tractor manufacturers who are small businesses.

### **3.1.3 Vocational Vehicle Chassis**

EPA is proposing to revise the Phase 1 vocational vehicle program and propose new standards. These proposed standards also reflect further sub categorization from Phase 1, with separate proposed standards based on mode of operation: urban, rural, and multi-purpose. EPA is also proposing alternative standards for certain low-volume emergency vehicles. EPA projects that the proposed vocational vehicle standards could be met through improvements in the engine, transmission, driveline, lower rolling resistance tires, workday idle reduction technologies, and weight reduction. In Phase 1, EPA adopted air conditioning (A/C) refrigerant leakage standards for tractors, as well as heavy-duty pickups and vans, but not for vocational vehicles. However, EPA now believes that it would be feasible to apply similar A/C refrigerant leakage standards for vocational vehicles in the Phase 2 proposal. Small business vocational vehicle chassis manufacturers may be required to report and/or certify their chassis meet the Phase 2 GHG standards.

Gliders are new truck chassis that are intended to be combined with used engines, transmissions and/or axles. Traditionally, gliders were produced to improve vehicles damaged in accidents or those that lost function with age. In these cases, often much of the powertrain was in working condition and gliders were a way to avoid the purchase of a completely new vehicle. Prior to 2011, fewer than 1000 glider kits were produced per year. In 2011 and 2012, sales spiked to almost 4000 per year. Many of the glider kits use pre-2002 engines, which have low fuel consumption and CO<sub>2</sub> emissions compared to current engines (the primary focus of this proposed rulemaking), but higher NO<sub>x</sub> and PM than current engines. EPA plans to include glider manufacturers in the vocational vehicle chassis manufacturer requirements in Phase 2.

### **3.1.4 Complete Pickup Trucks and Vans**

EPA is proposing to adopt new Phase 2 GHG emission and fuel consumption standards for complete heavy-duty pickups and vans that would be applied in largely the same manner as the Phase 1 standards. These standards would effectively require the use of most existing technologies, but would stop short of requiring significant use of strong hybrid powertrain technology or lean-burn gasoline direct injection (GDI). EPA is not aware of any small businesses who manufacture heavy-duty pickup trucks or vans.

### **3.1.5 Trailers**

EPA is, for the first time, proposing a set of GHG (as CO<sub>2</sub>) emission and fuel consumption standards for manufacturers of new trailers pulled by Class 7 and 8 tractors. The proposed standards would gradually require trailer manufacturers to achieve incrementally greater aerodynamic and/or tire improvements and cover more trailer types as the program phases in. Many of the existing CO<sub>2</sub>-reducing technologies have been evaluated and verified through EPA's SmartWay Transport Partnership. Adoption of and demand for these technologies continues to rise due to fleet participation in the voluntary SmartWay program, as well as enactment of California's Assembly Bill 32 (AB32), which required aerodynamic equipment and lower-rolling resistance tires on most tractors and trailers operating in California. Many trailer manufacturers are small businesses.

EPA is proposing that Phase 2 regulate manufacturers of on-highway dry van and refrigerated van (reefer) trailers. These trailer types constitute over 60% of the heavy-duty truck trailer market and have the greatest potential for application of aerodynamic technologies to reduce CO<sub>2</sub> emissions. Container chassis, which are used to transport intermodal containers, as well as some configurations of flatbed and tank trailers, could also be considered for inclusion in the aerodynamic requirements of the regulation. EPA is also considering requirements for tire technologies (e.g., lower-rolling resistance tires and automatic inflation systems) on nearly all on-highway trailers. Similar to the tractor program, trailers would not be expected to measure CO<sub>2</sub> emissions through testing. Instead, EPA’s vehicle simulation model, GEM, would be used to calculate an emissions rate. Some testing is expected to be required to obtain the inputs needed for the vehicle model.

#### **4 APPLICABLE SMALL ENTITY DEFINITIONS**

The Regulatory Flexibility Act (RFA) defines small entities as including “small businesses,” “small governments,” and “small organizations” (5 USC 601) and references the Small Business Act for the definition of “small businesses” using size standards based on the North American Industry Classification System (NAICS) (13 CFR 121.201). The standards being considered by EPA for this rulemaking are expected to affect a variety of small businesses. A listing of the NAICS codes identified as relevant to the potential rulemaking, along with their respective SBA size thresholds, is located in Table 2 in Section 5, below.

#### **5 SMALL ENTITIES THAT MAY BE SUBJECT TO THE PROPOSED REGULATION**

EPA expects the same industries affected by the Phase 1 rulemaking will also be affected by the proposed Phase 2 rulemaking. In addition, small businesses and trailer manufacturers are also expected to be included in the proposed Phase 2 rule. EPA used the criteria for small entities developed by the Small Business Administration (SBA) as a guide to identifying Small Entity Representatives (SERs) for this proposed rulemaking. Table 2 below lists industries potentially directly affected by the regulation. The NAICS Code and size threshold are shown as well.

**Table 2: Industry Sectors Potentially Affected by EPA’s Planned Action**

<b>Industry Expected in Rulemaking</b>	<b>NAICS Code</b>	<b>NAICS Description</b>	<b>SBA Size Threshold</b>
<b>Alternative Fuel Engine Converters</b>	333999	Misc. General Purpose Machinery	500 employees
	811198	All Other Auto Repair & Maintenance	\$7.0M (annual receipts)
<b>HD Pick-up Trucks &amp; Vans</b>	336111	Automobile Manufacturing	1,000 employees
<b>Vocational Chassis, Class 7 &amp; 8 Tractors</b>	336120	Heavy-Duty Truck Manufacturing	1,000 employees
<b>Trailers</b>	336212	Truck Trailer Manufacturing	500 employees
	333924	Ind. Truck, Trailer & Stacker Machinery	750 employees
<b>HD Engines</b>	336310	Motor Vehicle Gasoline Engine & Engine Parts	750 employees

Using this information, with EPA's certification data and employment information from the Hoover's Online business information database, EPA determined that only three of these affected industries contained small businesses: vocational chassis manufacturers, alternative fuel engine converters and trailer manufacturers, as described below. EPA believes there are about 115 trailer manufacturers and 100 of these manufacturers qualify as small entities with 500 employees or less. EPA identified 21 alternative fuel engine converters from previous certification data and 18 of these converters are considered small entities. Currently, 20 manufacturers who make chassis for vocational vehicles certify with EPA under the Phase 1 program. Three vocational chassis manufacturers contacted EPA to request an exemption from Phase 1 based on their small entity status. Gliders are a subset of vehicles is being considered for regulation under the proposed Phase 2 rulemaking. Glider manufacturers traditionally manufacture new vehicle bodies (vocational vehicles or Class 7 and 8 tractors) for use with older powertrains. EPA is aware of four glider manufacturers and three are small entities.

## **6 SUMMARY OF SMALL ENTITY OUTREACH**

Before beginning the formal SBREFA process, EPA actively engaged in outreach with entities that would potentially be affected by the upcoming rulemaking. EPA held phone conferences and face-to-face meetings with many of these companies to discuss the upcoming proposed rulemaking and to provide these contacts with an early opportunity to ask questions and discuss their concerns with the upcoming rulemaking.

Prior to convening the Panel, EPA conducted outreach with small entities that will potentially be affected by these regulations. On April 2, 2014, EPA issued a press release to solicit potential small entity representatives (SERs) to participate. Eleven eligible representatives from eight small businesses or organizations volunteered to participate as potential SERs. Two additional SERs volunteered later in the process.

EPA conducted a meeting and teleconference with potential small entity representatives (SERs) on June 19, 2014. This outreach meeting was held to solicit feedback from the potential SERs on their suggestions for the upcoming rulemaking. To help these entities prepare for the meeting and teleconference, EPA sent materials on June 5, 2014 to each of the potential SERs via email. A list of the materials shared with the potential SERs during the pre-Panel outreach meeting is contained in Appendix A. For the June 19, 2014 pre-Panel outreach meeting with the potential SERs, EPA also invited representatives from the Office of Advocacy of the Small Business Administration and the Office of Information and Regulatory Affairs within the Office of Management and Budget. A total of 10 potential SERs participated in the pre-Panel outreach meeting. EPA presented an overview of the SBREFA process, an explanation of Phase 1 and the planned rulemaking, and other background information. EPA asked the potential SERs to provide written comments by July 7, 2014. Comments discussed during the June 19 outreach meeting and written comments submitted by the potential SERs are summarized in Section 8 of this document.

The Panel convened on October 22, 2014 and EPA distributed additional information to the SERs for their review and comment in preparation for another outreach meeting. On November 5-6, 2014, the Panel met with the SERs to discuss the outreach materials and receive feedback on EPA's proposed approaches and possible flexibilities detailed in the outreach packets. The first meeting was held on November 5, 2014 for trailer manufacturers, followed by two separate meetings on November 6, 2014 with the alternative fuel engine converters and vocational chassis manufactures. The Panel also met with trailer manufacturer SERs on October 28, 2014, prior to the official meeting on November 5. The SERs were asked to provide written feedback on ideas under consideration for the proposed rulemaking and responses to questions regarding their experience with existing CO<sub>2</sub>-reducing technologies. The Panel received written comments from the SERs in response to the discussions at these meetings and we have summarized them in Section 8. Their full written comments are also attached (see Appendix B). In light of these discussions and comments, the Panel considered the regulatory flexibility issues specified by RFA/SBREFA and developed the findings and discussion summarized below.

## **6.1 Pre-Panel Outreach Meeting with Potential Small Entity Representatives**

A Pre-Panel Outreach Meeting was conducted for the potential Small Entity Representatives. The meeting included an overview of the Panel Process lead by EPA's Office of Policy. The program office, EPA's Office of Transportation and Air Quality, delivered a presentation introducing the proposed Phase 2 Heavy-Duty Greenhouse Gas Emissions Standards, followed by questions and a discussion.

### Meeting Attendance

- Lanelle Wiggins, EPA Office of Policy (OP)
- Peter Nagelhout, EPA-OP
- Jessica L. Brakora, EPA Office of Transportation and Air Quality (OTAQ)
- Glenn W. Passavant, EPA-OTAQ
- Tad Wysor, EPA-OTAQ
- Nathan Ranns, ORISE Intern for the EPA-OTAQ
- David Rostker, SBA Office of Advocacy (OA)
- Charley Maresca, SBA-OA
- Christine Kymn, SBA-OA
- Chad Whiteman, OMB Office of Information and Regulatory Affairs (OIRA)
- Karen Teslovich, CNG One Source, Inc.
- Jan Hoover, Diamatrix (phone)
- Fred Pearson, E-One, Inc. (phone)
- Bradley Shrock, E-One, Inc. (phone)
- Adam Jump, Indiana-Phoenix, Inc. (phone)
- Neil Johnson, Spartan Truck Company (phone)
- Andy Suhy, Power Solutions International, Inc. (phone)
- Bill Harp, Engine Certification Organization (representing CleanFUEL USA and helping Power Solutions International, Inc.) (phone)

- Jeff Sims, Truck Trailer Manufacturers Association (phone)
- John Freiler, Truck Trailer Manufacturers Association (phone)

### **6.1.1 Pre-Panel Outreach Meeting Summary**

Lanelle Wiggins of EPA's Office of Policy delivered a presentation titled "An Overview of the Small Business Advocacy Review Panel Process". David Rostker of SBA's Office of Advocacy emphasized the goals of the Panel and the role of the SERs in the process. Jessica Brakora of the program office (EPA's Office of Transportation and Air Quality) delivered a presentation titled "Medium- and Heavy-Duty Vehicle Greenhouse Gas Rule (Phase 2) – SBAR Pre-Panel Outreach Meeting". The presentation offered an overview of the Phase 1 regulation, a timeline of the Phase 2 program, and expected details of the new rulemaking.

EPA was asked when the NPRM for Phase 2 is expected, and EPA responded that it is expected in March 2015. When asked if regulated entities would have to comply with both the EPA and NHTSA regulations separately or together, EPA noted that EPA houses the certification process for both and that when an entity certifies with EPA, the information is transferred to NHTSA, so complying with one indicates compliance with the other.

A trailer manufacturer asked if the criteria for trailer regulations would be the reduction of CO<sub>2</sub>, a drag coefficient, or something else, and EPA described that the input to the vehicle simulation would be a drag coefficient and rolling resistance value and that the result that is shared with EPA is a CO<sub>2</sub> emissions rate (g/ton-mi).

A vocational chassis manufacturer asked EPA if it would be able to trade credits between divisions if they fall into different segments of the regulations. SBA asked the manufacturer to notify the Panel of how an ABT program could best work for its product line.

An alternative fuel converter asked if small companies could sell credits to large manufacturers to help them comply. EPA responded that conceptually, yes. However, the potential ABT program needs to be evaluated and the potential issue of "windfall credits" needs to be considered. SBA added that trading to a competitor is rare in ABT programs since it gives an advantage to competitors. Averaging and banking of credits is generally more valuable for companies.

An alternative fuel converter stated the importance of knowing what requirements are in the works as soon as possible to minimize the number of times operations are adjusted to comply. OMB asked EPA to consider existing renewable fuel standards when developing the Phase 2 program. SBA asked EPA to elaborate on whether it is thinking of promulgating different standards for different fuel types or a single standard for each engine class. EPA replied that the Phase 1 standards were by engine type only. For Phase 2, it is still under consideration whether specific rules for specific fuels will be developed.

## 6.2 SBAR Panel Outreach to Small Entity Representatives

### 6.2.1 Trailer Manufacturers

Since the trailer industry as a whole has never been regulated by EPA, the Panel wanted to ensure that the SERs had a thorough understanding of the materials in order to facilitate a constructive meeting during the official Panel Outreach meeting on to be held on November 5. On October 28, 2014, the Panel offered a supplementary outreach meeting for the trailer SERs via conference call and video conference. The purpose of the meeting was to present the materials and answer any clarifying questions regarding the materials or the Panel process.

#### 6.2.1.1 *Summary of the Supplementary Meeting, October 28*

##### Meeting Attendance

- Lanelle Wiggins, EPA Office of Policy (OP)
- Bill Charmley, EPA Office of Transportation and Air Quality (OTAQ)
- David Rostker, SBA Office of Advocacy
- Chad Whiteman, OMB Office of Information and Regulatory Affairs (OIRA)
- Jessica Brakora, EPA OTAQ
- Tad Wysor, EPA OTAQ
- Tia Sutton, EPA OTAQ
- Dennis Johnson, EPA OTAQ
- Peter Nagelhout, EPA OP
- Steve Silverman, EPA Office of General Council (OGC)
- Patrick Delehanty, SBA Office of Advocacy
- Jan Hoover, Diamatrix/Strick
- John Freiler, Truck Trailer Manufacturers Association
- Jeff Thompson, Timpote
- Steven Fairbanks, XL Specialized Trailers
- Shannon Richardson, XL Specialized Trailers
- David de Poincy, East Manufacturing

During the meeting, EPA presented the materials and solicited feedback on topics that could be further expanded during the official Outreach Meeting. SBA encouraged the SERs to provide specific information about their products physical characteristic and use patterns to help EPA effectively identify appropriate flexibilities and exemptions if necessary. Following the meeting, two SERs provided feedback to guide the discussion during the November 5 meeting.

The SER from Diamatrix/Strick provided descriptions of some trailer characteristics that may not be amenable to the technologies listed in the materials and asked for more information on how trailer families would be defined. He believes testing would be a “huge expense” and that his company would benefit from a chance to pick from approved devices. He asked for clarification on

what is required during each stage of the certification process in order to determine the amount of time and resources that would be required. He also confirmed that he would like access to the GEM simulation tool to test its functionality. In terms of the record keeping, he asked what type of data was required and how long the records were required to be kept. Finally, he stated that he would appreciate a workshop similar to the one held for tractors in Phase 1 in order to better prepare his company for regulation.

The SER from Timpte also sent comments prior to the Outreach Meeting. He described his company and product line and his experience with the technologies listed in the materials. He noted that he was unsure how well the technologies would be accepted by his customers and that each trailer is custom built and that their customers “are reluctant to allow us to add anything to the trailer that they didn’t specify.” He is also concerned that significant changes to the products may cause his customers to delay purchasing the products, particularly for aerodynamic devices. Requirements to install new components could require additional space in their facility as well as a need to hire more employees, which can be difficult in their rural community.

#### *6.2.1.2 Outreach Meeting, November 5*

##### Meeting Attendance

- Lanelle Wiggins, EPA Office of Policy
- Bill Charmley, EPA Office of Transportation and Air Quality
- David Rostker, SBA Office of Advocacy
- Chad Whiteman, OMB Office of Information and Regulatory Affairs
- Jessica Brakora, EPA OTAQ
- Tad Wysor, EPA OTAQ
- Tia Sutton, EPA OTAQ
- Chuck Moulis, EPA OTAQ
- Patrick Delehanty, SBA Office of Advocacy
- Karl Simon, EPA OTAQ
- Dennis Johnson, EPA OTAQ
- Nathan Ranns, ORISE intern with EPA OTAQ
- Peter Nagelhout, EPA OP
- Steve Silverman, EPA OGC
- Joan Rogers, EPA Office of Small Business Programs (OSBP)
- Jan Hoover, Diamatrix/Strick (by phone)
- John Freiler, TTMA (by phone)
- Steven Fairbanks, XL Specialized Trailers (by phone)
- Shannon Richardson, XL Specialized Trailers (by phone)
- David dePoincy, East Manufacturing (by phone)
- Andy Grove, East Manufacturing (by phone)
- Gary Christen, E.D. Etyhre (by phone)

During the Trailer SER Outreach Meeting, EPA's Office of Policy described the Panel process and the role of the SERs. The remaining portion of the allotted time was used for discussion of the materials. Diamatrix/Strick asked if businesses could have an opportunity to report to EPA more frequently than once at the end of the year to ensure their accounting was correct. EPA offered that it was possible to allow more frequent check-in opportunities if a company found value in them, though it would only require a single official report at the end of the year.

Several SERs asked for clarification of the "model year" definition and EPA explained the definition that is used for many of its regulatory programs. Most manufacturers' current model year strategies fit EPA's definition, though many agreed that a regulatory model year that aligned with a calendar year manufacture date would be the easiest to understand.

In terms of technologies, two of the SERs who make flatbed and specialty trailers noted that very few LRR tires were available in the sizes and ratings required for their trailers' applications. Many of the SERs had experience with automatic tire inflation (ATI) systems, but they commented that they most certainly did not get the same prices that the larger manufacturers were receiving. They also mentioned that some ATI systems are only compatible with certain suspension systems and were not always interchangeable with the specifications of a given trailer.

XL Specialized was concerned about ABT, since his company produced small volumes of just flatbeds. If a company produced dry vans or reefers that got a lot of credits, that company might be able to put zero technologies on their flatbeds. EPA stated that ABT averaging sets could be restrictive (e.g., flatbeds only) or very broad and requested the SERs provide feedback on their preference, since some companies may prefer to have very broad averaging sets.

East Manufacturing, who manufactures bulk commodity trailers, commented that their trailers are not in EPA's SmartWay program and XL Specialized confirmed the same for his flatbeds. Diamatrix/Strick noted his concern with testing and that he would prefer a vender-based option. East agreed that testing would be difficult to do. They sell so limited volumes of highly variable trailers and it would be difficult to group them to test.

Timpte asked how trailer families would be developed. EPA responded that trailers would be grouped based on their design and the performance they could achieve. The tractor program allowed families to be grouped according to the devices that were added. EPA requested descriptions of the SERs technologies (noting EPA's strict CBI provisions) and asked for objective physical characteristics that may help distinguish the trailers' use patterns.

Finally, the SERs commented that ATI systems seemed to be available to meet their current demand. LRR tires are less available in some applications. SBA asked if they provide tires or if the customers choose them. East noted that its standard option has "tried-and-true" options at a good cost. Some customers will request other tires for specific needs, but there is not a lot of demand for LRR tires on East's trailers. Timpte commented that the tire manufacturers started in the van market where there is the most demand and it is just now trickling down to the other trailer sectors.

## 6.2.2 Alternative Fuel Engine Converters

### 6.2.2.1 Summary of the Outreach Meeting, November 6

#### Meeting Attendance

- Lanelle Wiggins, EPA Office of Policy (OP)
- Bill Charmley, EPA Office of Transportation and Air Quality (OTAQ)
- David Rostker, SBA Office of Advocacy (Advocacy)
- Chad Whiteman, OMB Office of Information and Regulatory Affairs (OIRA)
- Jessica Brakora, EPA OTAQ
- Tad Wysor, EPA OTAQ
- Tia Sutton, EPA OTAQ
- Chuck Moulis, EPA OTAQ
- Alan Stout, EPA OTAQ
- Patrick Delehanty, SBA Advocacy
- Peter Nagelhout, EPA OP
- Paula Hoag, EPA, Office of Small Business Programs (OSBP)
- Michael DeGain, Engine Certification Organization (by phone)
- Todd Trauman, Engine Certification Organization (by phone)
- Josh Pietek, Engine Certification Organization (by phone)
- Karen Teslovich, CNG One Source (by phone)
- Andy Suhy, Power Solutions International (by phone)

The Outreach Meeting for Alternative Fuel Engine Converter (AFC) SERs began with a presentation by EPA's Office of Policy describing the Panel process and the role of the SERs. EPA then stepped through the meeting materials. The SER from PSI asked if it was possible to trade credits from natural gas (NG) engines with gasoline or diesel engines in an ABT system. EPA responded that there is nothing restricting EPA from allowing a very broad definition of averaging sets, particularly for small businesses. PSI commented that he did not support a lower standard for natural gas engines as was suggested in the NAS report. He felt that it negated any advantage that they might have with their NG engines. CNG One Source commented that their company also does not support lower standards for NG with no lower standards for the other alternative fuels. She highlighted that it is already difficult for them as a small business.

The AFC SERs asked EPA to expand on the OBD requirements for NG engines. EPA responded that for Phase 1, OBD requirements were limited to leak detection in the evaporative system and did not require measurement of CO<sub>2</sub> or methane. ECO stated that OBD requirements will be particularly difficult for converters since they do not have access to the algorithms developed by the base engine's OEM. Small businesses in particular, who don't have a direct connection with the large manufacturers, will have a difficult time writing new algorithms without access to the diagnostics from the OEM. CNG One Source stated that NHTSA already has leakage requirements for component failures tied to the pressure regulator and that other OBD requirements that are tied to

fuel characteristics will be hard for NG engines, since the fuel is so variable depending on the source.

In terms of N<sub>2</sub>O requirements, ECO stated that currently labs are only just now getting set to measure N<sub>2</sub>O and he estimated that measurement from a contracted test facility could cost around \$2000. Since there is little N<sub>2</sub>O expected from spark-ignition (SI) engines, he supports the use of “engineering analyses” to show that the N<sub>2</sub>O emissions are unchanged from a compliant base engine. However, a full waiver would be well received from the smalls his company represents. The SER from PSI commented that his company has control of the catalyst formulation for his compression-ignition (CI) engines, but that he doesn’t expect much change from a compliant CI engine either. He would advocate for allowing the engineering analysis as well. PSI also asked if engine manufacturers could receive credit for hybrid technologies, such as start-stop, that are associated with the engine. EPA stated that currently hybrid technologies are recognized at the vehicle level, but it could be considered.

The AFC SERs asked if they could participate in the vocational vehicle outreach meeting later in the afternoon and EPA responded that they were welcome to join the call.

### **6.2.3 Vocational Vehicle Chassis Manufacturers**

#### *6.2.3.1 Summary of the Outreach Meeting November 6*

##### Meeting Attendance

- Lanelle Wiggins, EPA Office of Policy (OP)
- Bill Charmley, EPA Office of Transportation and Air Quality (OTAQ)
- David Rostker, SBA Office of Advocacy (Advocacy)
- Chad Whiteman, OMB Office of Information and Regulatory Affairs (OIRA)
- Jessica Brakora, EPA OTAQ
- Tad Wysor, EPA OTAQ
- Tia Sutton, EPA OTAQ
- Chuck Moulis, EPA OTAQ
- Lauren Steele, EPA OTAQ
- Patrick Delehanty, SBA Advocacy
- Peter Nagelhout, EPA OP
- Lillian Harris, EPA Office of Small Business Programs (OSBP)
- Adam Jump, Indiana-Phoenix (by phone)
- Kevin Kelly, Indiana-Phoenix (by phone)
- Rand Smith, Sutphen Corporation (by phone)
- Karen Teslovich, CNG One Source (by phone)
- Andy Suhy, Power Solutions International (by phone)

EPA's Office of Policy presented a description of the Panel process and described the role of SERs to the vocational vehicle chassis manufacturers. Two of the AFC SERs were also in attendance for this meeting. EPA began by asking if the SERs were able to go through the materials prior to the meeting and they confirmed that did. The meeting began with SBA asking about the chassis manufacturers' experience with LRR tires. Sutphen, the fire apparatus manufacturer SER, stated that LRR tires are the most appropriate technology for their industry. They do have special, knobby tires, but there are some LRR available. SBA recommended that the SERs provide written comments with how much of their production need non-LRR tires for their applications (off-road, snow, etc).

In terms of transmissions, all fire trucks are automatics with PTO. Idle reduction is not feasible, because if they're stopped, they're in neutral. Sutphen has worked with axle manufacturers to improve gearing for performance (take-off and acceleration), but not for fuel economy. EPA noted that axle improvements could be through lubricants, which Sutphen responded would be easy to implement, but it doesn't provide a very large improvement. APUs could be of use for on-scene applications, but those engines aren't much cleaner. Hybrids do not have the power or PTO for emergency applications. Sutphen also noted that fire trucks shift from an axle driver to a pump driver and stay in gear to pump the water. Also, emergency vehicle purchase special engines and transmissions that have special calibrations for their applications. They are "certified" engines, but they were produced as part of the engine OEM's ABT program.

Indiana-Phoenix, the SER who manufactures cement mixers, indicated that a hydraulic pump turns the drum through PTO and when it gets to the job site, the vehicle has to be at an elevated idle to move the shoot. He has asked tire manufacturers for LRR data, but they do not provide it to him. All of Indiana-Phoenix's chassis use super single tires that are a cog-type tire. He asked the number of axles that would be represented in GEM. EPA responded that there would be a "representative" vehicle, which may not have the same number of axles, but it would not affect compliance if a company's production has more or fewer. He noted that 100% of his chassis products are rear engines and that they may be on the highway to get to a construction site, but spend most of their time sitting.

Both chassis SERs indicated that they believe they have limited ability to take advantage of ABT since their production volumes are so low and they sell very specific, custom chassis. SBA asked about air conditioning. Indiana-Phoenix stated that only about 10% of their sales ask for A/C and it takes about 20 feet of tubing to connect the A/C system from the rear engine to the cab. Sutphen said all of their fire trucks have A/C installed and they are very high capacity system. Neither company was familiar with the SAE J2727 leakage calculation standard for vehicles, but they committed to ask their engineers.

## **7 LIST OF SMALL ENTITY REPRESENTATIVES**

Table 3 lists the small entity representatives (SERs) that participated in the SBAR Panel for the Heavy-Duty Greenhouse Gas Phase 2 proposed rulemaking.

**Table 3: List of Small Entity Representatives**

<b>Name</b>	<b>Industry/Sector</b>	<b>Business Name &amp; Address</b>
<b>Michael DeGain, Bill Harp, Josh Pietak</b>	Engine Certification (on behalf of Engine Converter)	Engine Certification Organization Rocklin, CA 95677
<b>Karen Teslovich</b>	Alternative Fuel Engine Converter	CNG One Source, Inc. Erie, PA 16505
<b>Andy Suhy</b>	Secondary Engine Manufacturer	Power Solutions International, Inc. Wood Dale, IL 60191
<b>Adam Jump</b>	Vocational Chassis Manufacturer (Cement Mixer)	Indiana-Phoenix, Inc. Avilla, IN 46710
<b>Rand Smith</b>	Vocational Chassis Manufacturer (Fire Apparatus Chassis)	Sutphen Corporation Chassis Division Springfield, OH 45501
<b>Jan Hoover</b>	Trailer Manufacturer (Dry Van, Container, Specialty)	Diamatrix Fairless Hills, PA 19030
<b>Neil Johnson</b>	Trailer Manufacturer (Transfer, Pup)	Spartan Truck Company Sun Valley, CA 91352
<b>Trey Gary</b>	Trailer Manufacturer (Flatbed, Dry Bulk)	Dorsey Trailer Elba, AL 36323
<b>Steven Fairbanks</b>	Trailer Manufacturer (Flatbed)	XL Specialized Trailers Manchester, IA 52057
<b>Jeff Thompson</b>	Trailer Manufacturer (Dump, Grain)	Timpte Inc. Denver, CO 80203
<b>Gary Christen</b>	Trailer Manufacturer (Flatbed, Heavy-Haul)	E.D. Etnyre Oregon, IL 61061
<b>Dave de Poincy</b>	Trailer Manufacturer (Flatbed, Dump, Refuse)	East Manufacturing Randolph, OH 44265
<b>Jeff Sims, John Freiler</b>	Trailer Manufacturer Trade Assoc.	Truck Trailer Manufacturers Assoc. Gainesville, VA 20155

## **8 SUMMARY OF COMMENTS FROM SMALL ENTITY REPRESENTATIVES**

### **8.1 Summary of Written Comments Following Pre-Panel Outreach Meeting**

At the conclusion of the Pre-Panel Outreach Meeting, potential SERs were asked to submit written questions and comments to EPA. Five of nine entities submitted written materials to EPA. The following subsections summarize these submissions.

#### **8.1.1 Trailer Manufacturers**

One trailer manufacturer submitted written comments to EPA following the Pre-Panel Outreach Meeting. EPA received comments from Diamatrix on July 1, 2014.

#### *8.1.1.1 Feasibility of Proposed Technologies*

Diamatrix (holding company for Strick Trailers and Evans Trailers) discussed its range of specialty trailers, including drop-frame dry freight van trailers and trailers with belly boxes that may not be compatible with currently available GHG-reducing technologies (side skirts, etc.). Diamatrix expressed that being required to implement these technologies on these trailer types could result in a compliance issue or increased burden on the company. It expects to both acquire technologies from vendors and develop its own technologies in-house. Diamatrix also stated that it does not have any experience with customer response to current California requirements. Diamatrix primarily has customers east of the Mississippi River.

#### *8.1.1.2 Potential Reporting, Recordkeeping and Compliance Burdens*

Diamatrix had several questions regarding EPA's Greenhouse Gas Emissions Model (GEM). It asked if computer simulation and GEM were synonymous and expressed interest in seeing a demonstration of the software. Diamatrix expressed interest in learning more about the program in general and the overall compliance process. Diamatrix also asked how the compliance workshop materials from Phase 1 contained in slide 37 of the Pre-Panel Outreach Meeting presentation related to trailers.

Diamatrix indicated a lack of understanding regarding the Averaging, Banking, and Trading (ABT) program. Diamatrix asked EPA to further explain this program and how it may affect trailer manufacturers.

Diamatrix expressed that it is unsure of the upcoming rule's full impact on its operations given the preliminary status of the process. However, Diamatrix did state that it anticipates unique legal, administrative and record keeping burdens as a result of compliance since it currently does not engage in any such reporting.

Diamatrix also discussed the issue of finding space to store and install any new GHG-reducing technologies that it may need to meet requirements. Diamatrix anticipates having to create a new space for these technologies, as well as increased labor. However, Diamatrix expressed that it anticipates passing these labor costs on to the customer.

Diamatrix did not foresee any sector-unique business or competitive issues and was unsure of which flexibilities could serve its operations best given the preliminary nature of the rulemaking process.

#### *8.1.1.3 General Comments*

Diamatrix shared concern regarding an NTSB recommendation that NHTSA proposes a "Side Underride" regulation. Diamatrix stated that it is unsure of how this regulation and the upcoming Phase 2 rule will affect each other.

## **8.1.2 Vocational Vehicle Chassis Manufacturers**

Two vocational chassis manufacturers submitted written comments following the Pre-Panel Outreach Meeting. EPA received comments from E-One on July 3, 2014 and Indiana-Phoenix on July 7, 2014.

### *8.1.2.1 Feasibility of Proposed Technologies*

Indiana Phoenix, Inc. discussed the niche market it serves through the manufacturing of front discharge cement mixers. The company explained that technologies such as aerodynamics and tire inflation systems will be impractical for these vehicles as they frequently operate off road.

Indiana Phoenix, Inc. also stated that it does not currently produce any vehicles subject to Phase 1 requirements. The company has not had any experience with lower rolling resistance tires, tire inflation systems, or light weighting components. However, the company does use Cummins ISX12 engines, which do comply with Phase 1 standards. Indiana Phoenix, Inc. finds lower rolling resistance tires moderately feasible, inflation systems not very feasible, light weighting not very feasible, and Phase 1 engines moderately feasible.

### *8.1.2.2 Potential Reporting, Recordkeeping and Compliance Burdens*

Indiana Phoenix, Inc. anticipates that the potential regulations could require the company to add additional staff, acquire FEA software, and update computers. The company also mentioned potential administrative and record-keeping burdens could arise from the potential rulemaking. Indiana Phoenix, Inc. also expressed concern that the potential regulations could overwhelm its engineering development process.

Indiana Phoenix, Inc. mentioned that a partial exemption, partial delayed compliance and/or less stringent compliance could help the company comply. Indiana Phoenix, Inc. also asked if any grant money would be available to assist the company with compliance. The company also stated that the length of time given to engineer in the requirements and the stringency of compliance would affect which flexibilities would be most helpful.

E-One Inc. commented on the diversity of its product line. E-One Inc. expressed that it is concerned regarding the ability to be able to trade credits between different vehicle types within the same class of vehicles. The company expressed that having ABT between different vehicle types is imperative to its business model and potential future growth.

## **8.1.3 Alternative Fuel Engine Manufacturers**

Two alternative fuel converters/secondary engine manufacturers submitted written comments to EPA following the Pre-Panel Outreach Meeting. EPA received comments from CNG One Source and Power Solutions International (PSI) on July 7, 2014.

### *8.1.3.1 Feasibility of Proposed Technologies*

Power Solutions International stressed that GHG-reducing technologies all impact the design and construction of the long engine block assembly. As a secondary engine manufacturer, Power Solutions International states that it, along with other small business secondary engine manufacturers, have very little ability to influence the content of the new long engine block assemblies purchased from automotive companies. Furthermore, the company states that it receives very little support from the long block engine manufacturer for challenges faced when developing and applying the long block engine assembly into new applications.

In order to comply, Power Solutions International says it will need to invest in developing new and additional internal technological capability to be able to accommodate the more stringent standards. Also, small business secondary engine manufacturers will require additional time beyond that required by a large entity to adapt to more stringent standards.

### *8.1.3.2 Potential Reporting, Recordkeeping and Compliance Burdens*

CNG One Source expressed that it is unlikely to manufacture a high percentage of its CNG engines for medium- and heavy-duty use. Therefore, the company feels the great expense of research and development coupled with the high costs of formal emissions testing could limit the commercial availability of new CNG engine designs.

CNG One Source asked which specific testing would be required for each age category for medium- and heavy-duty CNG engines. CNG One Source also asked if any alternative testing methods could accomplish the same goals (portable emissions testing equipment, state emissions testing, etc.).

CNG One Source also discussed the disproportionate certification expenses in relation to larger companies. The company warned that this could hinder the development of new and innovative natural gas engine technologies. CNG One Source stated that small businesses will have little resources to develop their ideas which could lead to further curtailment of the industry. CNG One Source cites the Department of Energy's (through NREL) refusal to fund small businesses as a reason for this lack of resources.

Power Solutions International stated that small secondary engine manufacturers will need time to adjust and comply with the potential regulations. The company indicates that small businesses will need to invest in human resources and increased technological capabilities. These adaptations will require time. Power Solutions International also states that small businesses will likely never evolve to have the capability of a large automotive company. Furthermore, the company states that small entities will struggle to support the required investment to move toward these more stringent standards.

### 8.1.3.3 *General Comments*

CNG One Source emphasized the distinction between an engine with emissions certification and a safe, durable engine. CNG One Source stressed that consumers pay high prices for natural gas engines for medium- and heavy-duty applications (partly due to the initial certification costs passed on to the consumer) and are subject to high costs for ongoing maintenance. Consumers, however, believe that these high costs automatically designate the engine as safe and durable. CNG One Source argues that any CNG engine will likely pass emissions testing on the dynamometer, but will not always perform in the field. CNG One Source would like to see the development of a designation of a quality engine beyond merely meeting EPA standards.

CNG One Source asked about the incentive for emerging companies to follow regulations when there is a lack of EPA enforcement. The company cited shade tree mechanics offering conversions that are not EPA compliant and other small businesses thriving by performing “illegal” conversions as a reason for CNG One Source’s disadvantage in the market. CNG One Source states that companies performing illegal conversions offer cheaper conversions, and companies such as CNG One Source that do not tamper are unable to compete. CNG One Source states that if front-end costs of compliant systems were lower, it would recommend an annual or every three year emissions inspection which could facilitate continued maintenance on the systems and improve durability. As an example, the company cites the lack of follow through to maintain valve adjustments, which adversely impacts performance, durability, and emissions.

## **8.2 Summary of Written Comments following Panel Outreach Meeting**

EPA received comments from five manufacturers that included confidential business information (CBI) related to their product lines or their business practices. This information is not included in the discussion to follow, but will be used by EPA to develop the proposed rulemaking.

### **8.2.1 Trailer Manufacturers**

The following comments from Trailer Small Entity Representatives were received:

- Timpte – October 24, 2014
- Timpte – November 10, 2014
- Diamatrix – October 29, 2014
- Diamatrix – November 19, 2014
- East Manufacturing – November 4, 2014
- East Manufacturing – November 20, 2014

#### *8.2.1.1 Number and Types of Entities Affected*

Diamatrix provided production information for its company, stating that its dry freight van plant builds 2500 to 3000 units per year and estimating that 50% are 53’ and longer vans, 25% are 28’ vans, 15% are other length vans and 10% are drop frame and special vans, including belly boxes, etc.

## 8.2.1.2 *Feasibility of Proposed Technologies*

### 8.2.1.2.1 Aerodynamic Devices

Timpte stated that they have not installed any side skirts on their trailers. They only build bulk commodity trailers – primarily used to move grain, aggregate, and other free flowing materials – and a large portion of these materials are discharged into augers that are “swung” into position underneath of the trailer. As such, use of side skirts would preclude the ability of their customers to unload the trailers. Side skirts are not a practical solution for their style of trailer.

All of Timpte trailers have a portion of the trailer referred to as the Hopper Assembly which fills the majority of the space below the lower rail and between the tractor tires and the trailer tires. This Hopper Assembly would negate most of the positive impact of adding siding skirts to their trailers, even if it was practical to do so, as their trailers do not experience the same air turbulence pattern that traditional dry freight trailers generate. Most of them do not operate at highway speeds for other than short periods of time.

Timpte has also not had any experience with rear air skirts/fairings. Timpte does not see a practical reason why they could not be physically attached. They would interfere with the current access system that is mounted on the rear of the trailer, which is used to inspect the load. It may be possible to design a solution to that issue and to insure that the rear fairings did not interfere with the statutorily required lighting on the rear of the trailer.

The trailers built by Timpte are used to haul bulk commodity, any additional weight associated with adding any aerodynamic devices would be seen as a negative and result in resistance from the marketplace as it will reduce the amount of “product” that they can haul per load. If the required change included side skirts, Timpte stated that their business would be devastated as the customer base simply would not purchase the trailers at all. Those that would still buy the trailers would remove the side skirts as soon as they purchased the trailer as the skirts would prevent them from being able to unload the trailer. Timpte also stated that their trailers are unloaded out of the bottom of the trailer and typically into an auger system which is “swung” into place underneath of the trailer. The auger would reside and travel through the same space as the space the side skirts would be installed. That is why they are not a practical solution for their particular type of trailer.

East Manufacturing provided comments that stated due to the specific applications of their trailer types they fear that adding aerodynamic side fairings, front and rear fairings could create unsafe conditions, higher warranty costs and product liability issues if required to be installed. In addition, a high percentage of the products East builds are specified with 4 or more axles up to 8. East Manufacturing feels that none of the aerodynamic device currently used today would be able to be installed and if they could, would be of little to no effect. Also, there may be possible trailer length law issues associated with boat tails on their refuse trailers.

Diamatrix provided comments that stated they have experience with side and rear fairings. They commented that they have not seen any benefits with the implementation of these technologies as they are not the end user. They have heard from customers that they see a benefit in fuel reduction but those numbers are not concrete.

Diamatrix commented that they build some special trailers such drop frame dry freight van trailers and trailers with belly boxes that they may not be able to use existing technologies (side skirts) for reduction of CO2. This could create an issue of compliance or increased burden on us. What they will be specifically, if any, is unclear at this time. They also commented that trailer options or models that would preclude the use of some aero devices:

- Rear and side mounted liftgates or similar devices. Belly boxes and similar devices. Belly boxes are mounted under the trailer and can be used for storing tools or equipment necessary to the freight being hauled.
- Trailers with heater units or similar options installed would not permit the installation of nose mounted aero devices.
- Vents specified at the front and rear. Vents are usually used to provide airflow through the trailer while it is running on the highway. These may produce interference with nose or rear mounted aero devices.
- Side door steps. Steps are used to permit the entry into the trailer through the side door. The structure of and bracing of these steps may preclude the use of certain side aero devices.
- Trailers with more than three axles or trailers with spread axles. With these configurations there would be no room or very little room for side and underbelly devices to be installed.
- Trailers for intermodal use have underneath clearance criteria and lift pads that may cause issues with specific aero devices.
- Drop frame trailers. Drop frames trailers have a drop in the floor at or near the landing gear. The trailers or trailers similar to them would not be conducive to some aero devices.
- They build some trailers where they build a “shell” that their customer may convert into a portable office or add machinery to. The modifications that are done may require the removal of aero devices, if installed, or preclude the use of them altogether
- Container chassis, including extendible and specialty
- Flatbed trailers, including extendable; typically flatbeds have winches mounted under the side rail that could preclude the use of some side fairings.

Diamatrix commented that they will need to determine a place in the plant that they can install and store the aero devices. Depending upon the devices they may actually have to restructure their line stations to accommodate there assembly/installation. Diamatrix also provided cost estimates for side fairings (skirts) and range from around \$600 to \$800 not including installation or FET. Installation is around \$300. They stated that pricing does seem to be coming down.

#### 8.2.1.2.2 LRR Tires

Timpte has been installing almost exclusively Low Rolling Resistance Tires for the past two years.

East Manufacturing commented that the only tires currently applicable to their product types are rolling resistant dual tires, wide base single tires. LRR tires today are limited in availability, sizes and certain applications. It is unknown if they may have an adverse effect to tire wear on flatbed and multi-axle end dumps that are subjected to “High Scrub” tire situations which could cause owners to buy more tires in a shorter time period. This will increase the usage of materials and drive operating cost up and profitability down for Owner operators and Fleet owners.

East Manufacturing purchases tires from several manufacturers, but there are limited sizes available from each of them for their applications. East provided CBI related to the cost and volumes of tires installed in their trailers. Their concern is that if low rolling resistance tires and tire inflation systems were mandated for every trailer, then they would not be able to purchase the tires or inflation systems competitively compared to the large trailer manufacturers, such as Wabash, Great Dane, and Utility and it would put East in a non-competitive situation.

Diamatrix has experience with LRR tires. They commented that they have not seen any benefits with the implementation of these technologies as they are not the end user. They have heard from customers that they see a benefit in fuel reduction but those numbers are not concrete. Diamatrix also provided feedback that the \$320 incremental cost for LRR tires is good for an average - some manufacturers are less and some that are more.

#### 8.2.1.2.3 ATI Systems

Timpte has been installing automatic tire inflation systems for approximately a dozen years and currently have about a 3% adoption rate.

East Manufacturing commented that the only devices currently applicable to their product types are tire pressure monitoring systems and automatic tire inflation systems. East provided a list of the types of tire monitoring and inflation systems that they install on their trailers as part of a CBI submittal.

Diamatrix provided estimated costs for ATIS, ranging from \$500 to \$700 not including installation or Federal Excise Tax. Installation varies depending on the system and what can be prepped ahead of time.

#### 8.2.1.2.4 General Technology

Timpte raised a concern regarding the acceptance of the additional equipment by the end user. Each of their trailers is built uniquely to the customer’s specification and they are reluctant to allow Timpte to add anything to the trailer that they didn’t specify. Timpte has this same issue with any aspect of the trailer that is required by statute.

Timpte also commented that any significant change in the weight or cost of the trailer will cause a dramatic reduction in sales for a several year period of time as customers will defer purchasing the units with the additional aerodynamic devices as long as they can. They would more readily accept the increased cost than the increased weight.

Timpte stated that depending on what the requirements end up being, they would have to try and hire additional employees to handle the installation of the additional componentry, which is difficult to do in the small, rural community in which they are located. In addition, depending on the requirements, they would most likely have to invest in enlarging their facility to allow space for the installation of the additional devices.

Timpte would hope to be able to acquire technologies from vendors. As they are used to haul bulk commodities – weight and strength are the two most important features of their trailers. They are built primarily of aluminum. Their most popular models – the 40’ and 42’ overall length units – weigh only about 9000 pounds. Customers have the ability – and do – to buy options to reduce the weight such as aluminum wheels, lightweight hub & drum and other aluminum structural components. That said, being bulk commodity trailers, they will always fill them to achieve the legal loaded limit but the lighter the trailer, the more commodity that they will move per trip and hence the lower the number of trips.

Diamatrix stated that there will be engineering, purchasing and material handling costs associated with any device added to the trailers. Engineering will need to evaluate options, create drawings and bills of materials, ensure compliance of other components (lights, etc.) and to avoid interferences with other items on the trailers. Purchasing will have to buy the additional items, receive the items and process the invoices. Material handling will have these additional items to store and deliver to the line. They may also be required to hire shop personnel to install the aero devices.

East Manufacturing stated that they would have to acquire technologies from vendors as they do not have the resources for a full R&D study. East anticipates Product Liability lawsuits on dump and refuse trailers due to causing potential trailer rollovers and/or damage to equipment in landfills and construction sites.

### *8.2.1.3 Potential Reporting, Recordkeeping and Compliance Burdens*

Timpte commented that their units are highly configured. They sell primarily to farmers and owner/operators and they all have different opinions on what they want from an appearance and functionality standpoint. Timpte’s average order size is for 1.3 trailers. It would be impractical for us to try and certify their product on a basis that required actual aerodynamic testing. The cost would exceed their revenue.

East Manufacturing noted that these regulations would require East to add additional clerical staff, more Direct labor and additional Material Handling/indirect labor. Trailers serving niche markets are too small in annual production to affect the overall output of GHG CO<sub>2</sub> emissions. Since averaging probably will not work for small entities some other method of leveling the playing field between large and small manufacturers should be developed.

Diamatrix anticipates that they will have unique legal, administrative and record keeping burdens as a result of compliance since they do not currently have any such reporting. What specifically these will be is unclear at this time. Diamatrix is not quite sure at this time what the impact would be to their company or if they would need to add equipment or

staff. They definitely will have to spend what seems like a significant amount of time with certifications and reporting. If this is the case and they will likely have to add staff.

Diamatrix will have increased costs associated with engineering, purchasing and material handling at the plant level. They will also have increased costs, either at the plant or at the corporate level, for certification and reporting. They could also have increased costs if they are required to do testing rather than using a pre-approved aero device list.

Diamatrix commented that aerodynamic testing will be a huge expense, not only to small businesses, if they are required to do this. It would be beneficial if they could pick devices from an approved menu or list. If they are required to test and verify every device it would be a huge burden on small business and might put them out of business.

#### *8.2.1.4 General Comments*

##### *8.2.1.4.1 Model Year*

Timpte also commented in reference to Certification Year, tying the certification to the model year is more difficult for trailer builders than was described for automobile manufacturers.

Model Year designation is all over the board. Each manufacturer can decide when to change year models within two years. In the past most manufacturers changed over in June or July of each year. Today most change over January 1<sup>st</sup> of each year. This was driven by Fleet and customer requests. There is currently no government mandate regulating the timing of year model change for trailers. (Example: Today on January 1, 2015 most manufacturers will be building 2016 year model trailers). Conversely, there is nothing to keep manufacturers from pushing off the change to a year model out one or even two years at this point. Thereby delaying the mandate to comply with these regulations.

Diamatrix noted that their model year changes, officially, on January 1. However, if they have an order that starts in December and will finish in January, that entire order will be of the new model year.

##### *8.2.1.5 Suggested Flexibilities*

Timpte commented that the flexibilities that they believe that would be helpful would include:

- Alternatives to compliance that did not include the use of side skirts.
- Alternatives to compliance that did not require us to do actual aerodynamic testing as they could not afford that expense.

Timpte also stated that due to the low volume of construction of any given configuration of trailer, it is difficult for them to see how Averaging and Banking would benefit smaller manufacturers. It could easily put them at a disadvantage to larger trailer builders, especially those that might build a variety of different styles of trailers.

East Manufacturing proposed the following flexibilities:

- Full or partial exemption for their product types.
- Products spec'd with more than 4 axles should be fully exempted from this program.

East Manufacturing stated that Averaging, Banking and Trading will most likely not be available to East Mfg or other small business manufacturers simply due to the small number of trailers built annually of each product type. This inability to use Averaging, Banking and Trading will put small manufacturers at a market disadvantage compared to large business manufacturers.

East would like to see the time extended for compliance for all small business manufacturers so that they have more time to study the requirements and they associated perceived benefits. Extending the start date for small business entities will allow us to evaluate technology and the effects of the cost associated on their businesses.

Diamatrix proposed the following flexibilities that could reduce small entity burden:

- Exempt small businesses completely.
- Exempt small businesses for a period of time.
- Reduce the level of compliance for small businesses.
- Allow manufacturers to pick aero devices from a pre-approved list rather than having to test themselves. It is understood that manufacturers would test if they come up with a device that is not on the approved list.

Diamatrix also commented based on what they perceive that EPA will propose, they do not think that additional lead time will be required. That is, if they are permitted to pick from approved aero devices and not to have to test there should be no additional lead time. They also think that they would be able to figure out the reporting and record keeping prior to the effective date. Workshops for reporting and certification would be greatly beneficial.

## **8.2.2 Alternative Fuel Engine Converters**

The following comments from Alternative Fuel Small Entity Representatives were received:

- Power Solutions International – November 19, 2014
- CNG One Source – November 20, 2014

### *8.2.2.1 Number and Types of Entities Affected*

Power Solutions International would like to recommend that the establishment of a company's ability to use "small" business provisions of GHG standards be based on one of two criteria. Currently, the establishment of "small business" is based on the business size standards specified in 13 CFR 121.201. They would like EPA to give consideration, in future GHG rules, to also allow the establishment of "small volume manufacturer" based on total number of units sold. Such allowances

are provided in the criteria section 40 CFR 86.094-14(b)(1) on the basis of 10,000 or fewer units. This would allow companies to qualify to use “small business volume” provisions of the new rule by either means.

#### 8.2.2.2 *Feasibility of Proposed Technologies*

##### 8.2.2.2.1 Engine Long Blocks

Power Solutions International stated that imposing more stringent GHG regulations on secondary manufacturers, especially those that fit into the category of small businesses – which most do, makes it very difficult to architect base engine specific technology. The GHG reducing technologies all impact the design and construction of the long engine block assembly. Small businesses / secondary engine manufacturers have very little ability to influence the content of the new long engine block engine assemblies purchased from automotive companies. Small businesses/secondary engine manufacturers receive very little support from the long block engine manufacturers for challenges faced when developing and applying the long block engine assembly into new applications. The small business / secondary engine manufacturer will need to invest in developing new/additional internal technological capability to be able to accommodate more stringent standards.

Alternative fuel converters have limited ability to control features of base engine architecture in the incomplete engines that they convert, which significantly reduces the options for reducing emissions. Improvements could definitely be made on the base engines which would be helpful for a superior natural gas engine design. However, it appears that the OEM cannot justify the expense involved in making these changes, as they are not necessary for running the engines on diesel fuel. Therefore, secondary manufacturers and alternative fuel converters are limited in the amount of changes that can be made. Small entities could comply with emission standards within a range of the original engine’s emissions. When the industry improves, OEMs will be more likely to manufacture blocks that better support natural gas fuel.

CNG One Source also commented that the NAS 2014 report recommended separate CO<sub>2</sub> standards for natural gas fueled engines. NAS did not recommend new requirements for engines that use other alternative fuels. This limitation is unnecessary and unfairly targets the natural gas industry. In fact, having separate standards is punitive to the natural gas industry, and why? It was just in March 2013 that the NAS stated in their report, “Transitions to Alternative Vehicles and Fuels”, that the ‘CNGV emphasis scenario’, is the **only** scenario which achieves 50% reduction in petroleum use by 2030. Unnecessary limitations are going to kill the natural gas industry before it even has a chance to become widely adopted. At this time, there is no sound reason to implement different standards for natural gas engines. These limitations are barriers and will completely stifle an already struggling industry at a time when the technology and market adoption need to grow.

##### 8.2.2.2.2 Engine Calibration

CNG One Source stated that EPA believes most of the GHG standards can be met with proper tuning of fuel and emission control systems requiring the cost of some additional

engineering time. “The cost of some additional engineering time” is likely hundreds of thousands of dollars when you consider all of the proposed changes in standards. Increasing restrictions on emissions can compromise the integrity and longevity of the engine. Durability of the engine should be balanced with emissions standards.

#### 8.2.2.2.3 On Board Diagnostics (OBD) Requirements

CNG One Source commented that the Phase 2 proposal may include additional requirements for natural gas-fueled engines to control methane emissions and OBD requirements for CNG and LNG methane leaks. Methane leaks are presently not known to be significant as far as emissions are concerned. Again, this requirement is punitive to the natural gas industry. Currently the most common cause of methane leakage is a faulty pressure regulator. When the regulator fails, the engine ceases to operate, even if in motion on the highway. While this is a huge safety concern, as is as the flammability concern, it is not presently a significant *environmental* concern. Methane gas composition varies greatly depending on well gas, landfill gas, and utility grade gas. Even utility gas changes in composition during the winter months. Knowing this, how will the data be acquired for OBD? Vehicles running on low quality CNG (lower percentage of CH<sub>4</sub>) will not be detected as readily as vehicles running on high quality methane (higher percentage of CH<sub>4</sub>). Further, if vehicles run on lower quality gas, the engine components will be deteriorate much more quickly. However, to avoid MIL light and OBD issues with the EPA, operators could and would exploit this system. Detection of methane leakage by measuring mercaptan/odorant is faulty because:

1. It doesn't exist for LNG as it transitions from liquid to gas.
2. Not all fuel stations use mercaptan/odorant, even though it is required by NFPA

The engine manufacturer or converter might achieve desired EPA standards for certification. However, until the quality standard is built for CNG refueling stations, the OEM or AFC will continue to foot the bill to theoretically comply during testing but *will not* in real life applications.

#### 8.2.2.2.4 N<sub>2</sub>O Emission Standards

CNG One Source commented that N<sub>2</sub>O measurement may require additional equipment in some test facilities. EPA is considering the option of allowing AFCs to use “engineering analysis” to demonstrate that the base engine did not exceed the N<sub>2</sub>O cap and their conversion process would not impact N<sub>2</sub>O.

CNG One Source stated that EPA believes N<sub>2</sub>O measurement devices can be purchased, if necessary, for ~\$100,000. These prices will either be incurred by small business or passed along to small business. Is this necessary for AFC or secondary manufacturers? How much will facilities charge to take N<sub>2</sub>O measurements? Even certification companies contract with a third parties for testing. Will there be a backlog with the number of engine manufacturers having to use a limited number of facilities? An engineering analysis would be appropriate, although this will add engineering expenses as well.

#### 8.2.2.2.5 CH<sub>4</sub> Leak Reduction

CNG One Source commented that EPA is considering more stringent CO<sub>2</sub> emission standards, including CH<sub>4</sub> and N<sub>2</sub>O caps for all engine types. According to the EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2012 published April 15, 2014, methane emissions are not known to be significant in the transportation sector. More stringent standards are not necessary for natural gas engines.

CNG One Source also commented that the Phase 2 standards have not been set yet. CH<sub>4</sub> may be more challenging for natural gas engines. Improper fueling can result in high levels of unburned CH<sub>4</sub> emissions. Converted CI (diesel) engines would need to ensure the crankcase is closed with a suitable ventilation system installed to reduce blow-by CH<sub>4</sub> emissions. CH<sub>4</sub> standards should not be more restrictive. There is no clear evidence to support that mobile methane use from natural gas vehicles significantly affects CH<sub>4</sub> emissions. Improper fueling should not impact the engine's emissions. Further restrictions on methane emissions are unwarranted.

CNG One Source stated that if the base engine for conversion is a CI engine with an open crankcase, they estimate a closed crankcase ventilation system to cost ~\$500. This design will affect engine durability as the byproducts of the natural gas system will deteriorate the engine components. For example, H<sub>2</sub>S combined with CO<sub>2</sub> will create fissures in the steel. Methane emissions occurring in a closed system would likely create an unsafe and potentially hazardous situation. Allow open crankcase for two reasons: (1) Methane emissions are not known to be significant in natural gas vehicles. (2) Maintain vehicle safety by eliminating potentially hazardous closed "ventilation" system.

#### 8.2.2.3 *Potential Reporting, Recordkeeping and Compliance Burdens*

CNG One Source commented that small businesses are disproportionately burdened by certification expenses compared to large businesses and have few funding opportunities for research and development. Small businesses must use a higher percentage of their budget for research and development and costs associated with certification. CNG One Source stated that the government has specifically told them that they have no interest in funding small businesses involved with engine development. Therefore, the burden is entirely on the engine manufacturer. Larger companies with greater resources not only spend a smaller share on research and development, they are also candidates for federal funding. This excludes small businesses from realistically competing in the marketplace. If regulations burden small businesses, EPA should identify and provide *realistic* resources to assist small businesses achieve certification. The EPA could provide personnel to assist small entities in the certification process rather than redirect the small entities to costly third party companies.

CNG One Source commented regarding their concern over lack of enforcement against companies that do not certify their converted engines. The majority of natural gas vehicles in the United States are not EPA compliant. The EPA has not provided adequate enforcement, and there is no real incentive for companies to comply with EPA regulations. By choosing to register with the EPA and follow all regulations, CNG One Source is at a huge disadvantage. Their company will bear the burden of expense on the research and development, certification, and use of time and resources to satisfy the government. In real life applications, consumers and trucking companies

are finding ways to convert their vehicles to run a natural gas because of the fuel cost savings. They literally weigh out the risk and cost of fines from the EPA with the price of EPA compliant engines. CNG One Source has fielded such phone calls, and unfortunately, contrary to their recommendations, the trucking companies ultimately opted to purchase non-EPA compliant engines. In addition, CNG One Source has visited with companies who have modified the EPA certified engines to improve performance. Some of these companies have even hollowed out the catalytic converter as well as making other dramatic modifications. There is already a very high level of non-compliance, and the more stringent the regulations and the more expensive the engines (noting that the prices of development, improved components, and certification will be passed on to the consumer), the greater the degree of non-compliance. The only way to change behaviors and create compliance is to provide adequate enforcement. On the state level, there have been discussions that enforcement will discourage the industry, which seems to indicate that there is no desire anywhere to provide enforcement. If there is no real enforcement, what is the incentive to comply? Collecting fines from enforcement could provide revenue to the EPA to assist small entities in achieving certification.

CNG One Source commented that converters will need to certify their engine and also work with the vehicle manufacturer to ensure their new vehicle meets the GHG standards with the alternative fuel engine. Will secondary manufacturers and alternative fuel converters be *required* to work with the vehicle manufacturer? This could be a cumbersome process for some small businesses. In addition, when the industry grows and CNG engines become competitive in the market, OEM's can eliminate the small business "partner." CNG One Source recommends EPA allow engines to be certified independently so that they can be used in different vehicles and applications.

CNG One Source commented that engine manufacturers may be required to provide engine fuel map data to vehicle manufacturers as inputs for EPA's vehicle certification model. What data will be treated as CBI? Could this requirement encourage OEMs and vehicle manufacturers to take the conversion process in house and exclude the small businesses? CNG One Source would like information on the process of becoming EPA certified to take such measurements.

CNG One Source also stated that additional incremental increase in costs associated with this proposed rulemaking could include attorney fees to interpret regulations, accountant fees to manage sale and compliance figures, administrative staff for record keeping. Most companies in the alternative fuels industry are struggling to make a profit as it is still a small niche market. Many companies have gone out of business or their stocks are failing. The additional incremental costs will excessively burden the small businesses who are the ones willing to comply with the EPA's regulations and in turn suffer the direct, indirect and induced costs of meeting and managing these stringent regulations.

#### *8.2.2.4 Suggested Flexibilities*

Power Solutions International commented that the small business/secondary engine manufacturer will require additional time, beyond that required by a large entity, to adopt more stringent standards. Additionally, PSI would be opposed to more stringent GHG regulations for NG fueled engines for the following reasons:

- As a small business, they are going to be required to use ABT credits to bring some of their engine families into GHG compliance. Specifically, some of their gasoline engine models will require credits to bring CO<sub>2</sub> into compliance. With the 627 g/hp-hr standard, there are a good amount of credits that can be generated from their NG fueled engine families. These credits will help Power Solutions International bring other families into compliance. More stringent GHG standards for NG fueled engines would impede their ability to bank credits.
- Further stringency on GHG standards for NG fuel may not incentivize vehicle manufacturers to adopt NG engine models for their products.

Power Solutions International also stated that the establishment of a “technology” credit to be applied to engine based GHG certification for use of such technologies as Start/Stop or other similar hybridization. Currently, there is no ability for an “engine MOR” to realize an advantage for such technology based on testing over the engine dynamometer based transient FTP cycle. An establishment of a technology credit based on the use of such technology would incentivize implementation of such technology by heavy duty engine companies. It is recognized that some method of establishing the level of a credit would need to be developed. There are many reports of hybridization based fuel efficiency improvements in the heavy duty vocational markets that cover a wide band of fuel efficiency improvements. The type of hybridization and duty cycle use of the vehicle are both contributors to the magnitude of the fuel economy improvement.

CNG One Source commented above that further restrictions on methane emissions are unwarranted. They also suggested above that EPA could provide personnel to assist small entities in the certification process rather than redirect the small entities to costly third party companies. CNG One Source also recommends above that EPA allow engines to be certified independently so that they can be used in different vehicles and applications. CNG One Source suggested that an engineering analysis would be appropriate in lieu of measuring N<sub>2</sub>O emissions, although this will add engineering expenses as well.

CNG One Source stated that small businesses will require additional time to invest in resources required to adopt new standards. Small businesses will have to have more capital in order to comply with the new regulations. Changes in government regulations is discouraging to customers and investors. Allow additional time (one year) for implementation by small entities.

CNG One Source also stated that ABT allows a manufacturer to internally average similar models (by engine architecture or engine size), generate credits for future use if they over-comply, and sell banked credits to other under-complying manufacturers or buy another manufacturer’s banked credits to cover their own deficits. Although this system theoretically can benefit small entities, the system heavily favors large corporations. Most of these proposed regulations seriously favor large corporations and are dangerously close to creating a monopoly in the industry. Small entities are likely to specialize in limited types of engines only.

### **8.2.3 Vocational Chassis Manufacturers**

The following comments from a Vocational Chassis Manufacturer Small Entity Representative were received summarizing comments made during the teleconference:

- Indiana Phoenix – November 19, 2014

### *8.2.3.1 Feasibility of Proposed Technologies*

#### 8.2.3.1.1 LRR Tires

Indiana Phoenix stated that all of the trucks they build are 6X6 configuration with up to two tag axles and two pusher axles. The majority of the trucks they build use wide based single tires on the rear drive axles and all use super single on the steer axle. Most of their customers use a cog type traction tire since they spend a lot of time on construction sites.

#### 8.2.3.1.2 Engine Improvements

Indiana Phoenix commented that their customers deliver usually within 25 miles of the batch plant due to the cure time of the concrete. The drum must be turning anytime there is concrete in it. Hydraulic pumps are either on-engine or FEPTO (power take-off) driven and the only power used through the transmission is to move the truck. The on-engine hydraulic pump is commonly used for both power steering and discharge chute control.

#### 8.2.3.1.3 Weight Reduction

Indiana Phoenix commented that weight reduction as a means of achieving compliance is ineffective since their customers are payload driven.

#### 8.2.3.1.4 A/C Leakage

Indiana Phoenix commented that the take rate on the air conditioning option is about 10% and it is assembled in-house. Since these vehicles are front cab, rear engine configuration the refrigerant lines are approximately 20 feet long. Indianan Phoenix has not evaluated their A/C system for compliance to SAE J2727.

#### 8.2.3.1.5 Other Technologies

The SERs did not provide written comments regarding idle reduction, transmission improvements, axle improvements, or hybrids. However, some of their verbal comments are noted in the summary of the meetings described in Section 6.

## **8.2.4 Potential Reporting, Recordkeeping and Compliance Burdens**

Indiana Phoenix did not provide any comments related to compliance burdens.

## **8.2.5 Suggested Flexibilities**

Indiana Phoenix did not provide any suggestions for flexibilities.

## **9 PANEL FINDINGS AND DISCUSSION**

### **9.1 Number and Types of Entities Affected**

EPA identified 115 trailer manufacturers and 100 of them are small. Currently 24 vocational chassis manufacturers have registered with EPA under the Phase 1 rulemaking and three have confirmed small entity status to obtain an exemption for MY 2014. Twenty alternative fuel engine converters are currently registered with EPA to certify their converted HD engines for criteria pollutants. Eighteen of those engine converters are small. EPA is aware of four glider manufacturers and three of these companies are small businesses.

### **9.2 General Potential Reporting, Recordkeeping and Compliance Burdens**

For any emission control program, EPA must have assurances that the regulated products will meet the standards. The program that EPA is considering for manufacturers subject to this proposal will include testing, reporting, and recordkeeping requirements. Testing requirements for these manufacturers could include use of EPA's Greenhouse gas Emissions Model (GEM) vehicle simulation tool to obtain the overall CO<sub>2</sub> emissions rate for certification of vocational chassis and trailers, aerodynamic testing to obtain aerodynamic inputs to GEM for some trailer manufacturers and engine dynamometer testing for alternative fuel engine converters to ensure their conversions meet the proposed CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O engine standards. Reporting requirements would likely include emissions test data or model inputs and results, technical data related to the vehicles, and end-of-year sales information. Manufacturers would have to keep records of this information for eight years.

### **9.3 Trailers**

#### **9.3.1 Feasibility of Proposed Technologies**

##### *9.3.1.1 Aerodynamic Devices*

Diamatrix/Strick, the box trailer manufacturer SER, has some experience installing side skirts. However, many of their box trailers have unique physical features that limit the use of aerodynamic devices that cover the underside of the trailer. This company does not have experience with rear fairings or boat tail aerodynamic devices.

None of the non-box trailer manufacturers had experience with aerodynamic technologies and cited several common use patterns for their specific trailer types that would damage or eliminate the benefit of these devices.

##### *9.3.1.2 LRR Tires*

Most SERs have some experience with lower rolling resistance (LRR) tires, though they expressed concern that they have not been able to obtain LRR *data* from the tire manufacturers.

Several SERs indicated that there were limited LRR tires available for their non-box trailers at this time, since most tire manufacturers are focusing on developing lower rolling resistance tires for long-haul box trailers where operators will see the greatest benefit. Other manufacturers, whose trailers are used in off-road or heavy-haul applications, were concerned about the performance and durability of LRR tires, since so few are currently being used in conditions that have heavy loads, high scrubbing potential, or the need for additional traction.

One SER also expressed concern that if it would be required to install LRR tires or tire inflation systems on all of their trailers, it would not be able to purchase them competitively compared to their larger counterparts, which the SER said would put the company at a competitive disadvantage.

#### *9.3.1.3 Automatic Tire Inflation (ATI) Systems*

Most trailer SERs have experience installing ATI systems on some of their trailers, but ATI systems are not installed as a standard feature on any of the SERs' current products. The non-box trailer manufacturers have installed tire inflation systems on some trailers, but indicate that the customers are reluctant to purchase the systems because of the added cost. In addition, the manufacturers noted that inflation systems are often tied to a particular suspension system and they cannot be applied universally.

### **9.3.2 Potential Reporting, Recordkeeping and Compliance Burdens**

Trailer manufacturers are currently not regulated by EPA and do not have experience with recordkeeping, reporting, or compliance. EPA is proposing that trailer manufacturers certify their trailers using EPA's Greenhouse gas Emissions Model (GEM) vehicle simulation tool to obtain the overall CO<sub>2</sub> emissions rate. Some manufacturers would need aerodynamic inputs to run GEM, which could be obtained through aerodynamic testing. EPA is proposing a voluntary vendor-based testing program in which aerodynamic technology manufacturers could perform the required testing and have their technologies pre-approved with EPA for trailer manufacturers to use. This is similar to how many technology vendors have been verified by the existing voluntary EPA SmartWay Program. Reporting requirements for trailer manufacturers would likely include emissions test data (model inputs and results), technical data related to the trailers, and end-of-year sales information. Manufacturers would have to keep records of this information for eight years.

Two SERs stated that emissions averaging, banking and trading (ABT) would be difficult since their companies have very specific product lines and relatively low sales volumes. Larger manufacturers, who have greater diversity of products and much higher sales, would have a significant advantage in averaging and banking.

The SERs have emphasized that their industry is highly custom-order and most trailers are designed to specifications identified by the customer. One SER noted that it is difficult to add anything to the trailer that his customer did not specify, including components "required by statute". He is concerned that some customers would simply refuse to buy from them or would defer sales as long as possible to avoid the requirements.

Additionally, all of the SERs expressed concern over the prospect of requirements to perform aerodynamic testing on their trailers. The cost and resources required for a single test would be a significant burden and requirements to do annual testing of multiple trailers could add enough cost to end their business.

Finally, all trailer manufacturers noted that they expect to need to hire additional staff to be able to comply with any new requirements, including administrative staff to help with recordkeeping and reporting, as well as technical staff to evaluate and install new technologies. One SER also indicated that their physical facilities would require significant changes to the storage capacity and possibly the installation process, to accommodate the new devices and installation stages.

### **9.3.3 Suggested Flexibilities**

Comments from trailer manufacturer SERs indicate that these companies are familiar with most of the technologies described in the materials, but have no experience with EPA certification and do not anticipate they could manage the accounting and reporting requirements without additional staff and extensive training. Performance testing, which is a common requirement for many of EPA's regulatory programs, is largely unfamiliar to these small business manufacturers and the SERs believe the cost of testing would be a significant burden on their companies. In light of this feedback, the Panel recommends a combination of streamlined compliance, which minimizes tracking and testing requirements, and targeted exemptions for these small businesses. The Panel believes these strategies will achieve many of the benefits for the environment by driving adoption of CO<sub>2</sub>-reducing technologies, while significantly reducing the burden that these new regulations would introduce on small businesses.

#### *9.3.3.1 Box Trailers*

Box trailer manufacturers have the benefit of relying on the aerodynamic technology development initiated through EPA's voluntary SmartWay program. The Panel is aware that EPA is planning to propose a simplified compliance program for all manufacturers, in which aerodynamic device manufacturers have the opportunity to test and register their devices with EPA as technologies that can be used by trailer manufacturers in their trailer certification. This pre-approved technology strategy is intended to provide all trailer manufactures a means of complying with the standards without the burden of testing. At the time of this report, it is unclear if this strategy will be available indefinitely, or if it will be an interim flexibility to allow manufacturers to ease into a testing-only compliance program. In the event that this strategy is limited to the early years of the trailer program for all manufactures, the Panel recommends that small manufacturers continue to be given the option to use pre-approved devices in lieu of testing.

In the event that small trailer manufacturers adopt pre-approved aerodynamic technologies and the appropriate tire technologies for compliance, the Panel does not believe it is necessary to require the use of a vehicle emissions model, such as GEM, for certification. Instead, the Panel believes it could be possible for manufacturers to simply report to EPA that all of their trailers include approved technologies.

### *9.3.3.2 Non-Box Trailers*

The Panel recommends that EPA not require the installation of aerodynamic devices for non-box trailers. Some of the non-box trailer manufacturers SER have seen prototype-level demonstrations of aerodynamic devices on non-box trailers. However, most non-box trailer SERs identified unique operations in which their trailers are used that preclude the use of those technologies and many that they have seen used on box trailers today.

Some non-box trailer manufacturers have experience with LRR tires and ATI systems. However, the non-box trailer manufacturer SERs indicated that LRR tires are not currently available for some of their trailer types. The SERs noted that tire manufacturers are currently focused on box trailer applications and there are only a few LRR tire models that meet the needs of their customers. The Panel believes EPA should ensure appropriate availability of these tires in order for it to be deemed a feasible means of achieving these standards and recommends a streamlined compliance process based on the availability of technologies. The Panel suggests that the best compliance option from a small business perspective would be for EPA to pre-approve tires once they are available in sufficient quantities on the market, similar to the approach being proposed for aerodynamic technologies, and to maintain a list that could be used to exempt small businesses when no suitable tires are available. However, the Panel recognizes the difficulties of maintaining an up-to-date list of certified technologies. The Panel recommends that, if EPA does not adopt the list-based approach, the agency consider a simplified letter-based compliance option that allows manufacturers to petition EPA for an exemption if they are unable to identify tires that meet the LRR performance requirements on a trailer family basis.

### *9.3.3.3 Trailers with Unique Use Patterns*

The Panel recommends excluding all trailers that spend a significant amount of time in off-road applications. These trailers may not spend much time at highway speeds and aerodynamic devices may interfere with the vehicle's intended purpose. Additionally, tires with lower rolling resistance may not provide the type of traction needed in off-road applications.

### *9.3.3.4 General Flexibilities for All Small Trailer Manufacturers*

The Panel recognizes that some manufacturers, who have diverse product lines and high sales volumes, may benefit from an emissions averaging, banking and trading (ABT) strategy. However, due to the custom-order nature of the trailer industry, SERs have expressed their concern that ABT may provide an opportunity for historically loyal customers or customers with large fractions of a manufacturer's business to bargain for the portion of a manufacturer's sales that have minimal requirements. Based on the low volume of sales and niche market of many small business trailer manufacturers, small businesses in particular may have little leverage in this situation and risk losing their customers to larger manufacturers who have credits to spare. In addition, the accounting and reporting burdens of ABT may preclude small businesses from participating in the flexibility.

Due to the potential for reducing a small business's competitiveness compared to the larger manufacturers, as well as the ABT record-keeping burden, the Panel recommends EPA consider

small business flexibilities to allow small entities to opt out of ABT without placing themselves at a competitive disadvantage to larger firms that adopt ABT, such as a low volume exemption or requiring only LRR where appropriate. EPA should also consider flexibilities for small businesses that would ease and incentivize their participation in ABT, such as streamlining the tracking requirements for small businesses. In addition, the Panel recommends that EPA request comment on the feasibility and consequences of ABT for the trailer program and additional flexibilities that will promote small business participation. In addition, for all trailer types that will be included in the proposal, the Panel recommends a 1-year delay in implementation for small trailer manufacturers at the start of the proposed rulemaking to allow them additional lead time to make the proper staffing adjustments and process changes and possibly add new infrastructure to meet these requirements. In the event that EPA is unable to provide pre-approved technologies for manufacturers to choose for compliance, the Panel recommends that EPA provide small business trailer manufacturers an additional 1-year delay for each subsequent increase in stringency. This additional lead time will allow these small businesses to research and market the technologies required by the new standards.

## **9.4 Alternative Fuel Engine Converters**

### **9.4.1 Feasibility of Proposed Technologies**

#### *9.4.1.1 Engine Testing and Measurement*

The feedback received from the Alternative Fuel Engine Converter (AFC) SER comments suggests that the testing procedures for CO<sub>2</sub> and CH<sub>4</sub> are relatively straightforward and the small businesses expect to be able to test and report those emissions to EPA. However, N<sub>2</sub>O measurement is more challenging and requires a separate, costly measuring device. For the small converters who currently do testing in-house, the expense of purchasing one of these instruments would be a significant burden. The other converters, who contract their testing to outside facilities, believe those facilities would have N<sub>2</sub>O measurement capabilities by the start of this proposed rulemaking and the added expense of including N<sub>2</sub>O measurements is expected to be manageable. However, none of the SERs believe the changes they are making to their engines significantly impact N<sub>2</sub>O production compared to the base engine and they support the use of engineering analysis to demonstrate compliance with N<sub>2</sub>O standards.

In addition, the SERs expressed concern that, if they are required to perform *vehicle* certification in addition to their own engine testing, they do not believe they will be able to obtain the necessary *vehicle* information, such as detailed information about transmissions or computer controls. According to the SERs, the large OEMs that provide these vehicles have little incentive to provide any vehicle information to the small engine converters and these converters have no control over many of the vehicle characteristics.

#### *9.4.1.2 Engine Calibration and Catalyst Tuning*

The AFC SERs expressed concern about their ability to meet on-board diagnostic (OBD) requirements, since they do not always have access to the diagnostic algorithms and calibrations of

the base engines they convert from other manufacturers. Finally, N<sub>2</sub>O is not expected to be high for converted spark-ignition (SI) engines, but can be a concern for converted compression-ignition (CI) engines if the dosing of their aftertreatment devices is not properly calibrated with the new fuel. Similar to OBD, these small engine converters often have very little information about the catalysts' dosing and the calibration of the aftertreatment devices.

#### *9.4.1.3 CH<sub>4</sub> Leak Reduction and More Stringent Standards for Natural Gas Engines*

Most of the engine converters believe their converted engines would be capable of meeting engine CO<sub>2</sub> standards that are more stringent than Phase 1. Engine converters who convert engines to run on natural gas do not support separate standards for natural gas-fueled engines citing the difficulties they already have in succeeding in the engine market.

#### *9.4.1.4 Enforcement*

One SER's comments indicated that many small businesses are converting engines and not making the effort to comply with EPA's regulations. This company believes they are at a competitive disadvantage with these companies who are converting engines with a focus on performance, but with little concern for durability or the effect on the environment. The SER suggested EPA provide incentives for compliance and increase enforcement to create a more level playing field.

### **9.4.2 Potential Reporting, Recordkeeping and Compliance Burdens**

EPA expects that the recordkeeping, reporting, and compliance provisions of the proposed rule for alternative fuel engine converters will be similar to those in place today for heavy-duty engine criteria pollutant requirements. SERs did not provide comments to suggest an increased burden due to recordkeeping and reporting to EPA, but noted that the option of conducting an engineering analysis for N<sub>2</sub>O in lieu of testing would reduce their burden.

### **9.4.3 Suggested Flexibilities**

To reduce the compliance burden of small business engine converters who convert engines in previously-certified complete vehicles, the Panel recommends allowing engine compliance to be sufficient for certification. This would mean the converted vehicle would not need to be recertified *as a vehicle*. This flexibility would eliminate the need for these small manufacturers to gather all of the additional component-level information in addition to the engine CO<sub>2</sub> performance necessary to properly certify a vehicle with GEM (e.g., transmission data, aerodynamic performance, tire rolling resistance, etc.). In addition, the Panel recommends that small engine converters be able to submit an engineering analysis, in lieu of measurement, to show that their converted engines do not increase N<sub>2</sub>O emissions. Many of the small engine converters are converting SI-engines, and the catalysts in these engines are not expected to substantially impact N<sub>2</sub>O production. Small engine converters that convert CI-engines could likely certify by ensuring that their controls require changes to the SCR dosing strategies.

Based on the comments received from SERs, the Panel does not recommend separate standards for small business natural gas engine manufacturers. The Panel believes this would discourage entrance into this emerging market by adding unnecessary costs to a technology that has the potential to reduce CO<sub>2</sub> tailpipe emissions. In addition, the Panel believes additional leakage requirements beyond a sealed crankcase for small business natural gas-fueled CI engines and requirements to follow industry standards for leakage could be waived for small businesses with minimal impact on overall GHG emissions.

Finally, the Panel recommends that small engine converters receive a one-year delay in implementation for each increase in stringency throughout the proposed rule. This flexibility will provide small converters additional lead time to obtain the necessary equipment and perform calibration testing if needed.

## **9.5 Vocational Chassis Manufacturers**

### **9.5.1 Feasibility of Proposed Technologies**

The vocational chassis SERs who participated in the Panel produce specialized vehicles with use patterns that are not amenable to most of the GHG-reducing technologies outlined in the materials. SERs commented that LRR tires would be feasible if appropriate tires were available for their applications, though limited LRR tires are available at this time. Idle reduction technologies may not be feasible since their products have operational requirements (i.e., turning a cement mixer or pumping water) when they are stopped. The transmissions and axles are also uniquely developed for performance in their very specialized applications and many of the improvements to these components for CO<sub>2</sub> reduction will not be appropriate for these applications. The SERs also suggested that hybrid technologies may not be feasible for these use patterns.

### **9.5.2 Potential Reporting, Recordkeeping and Compliance Burdens**

The Panel recognizes that many of the small vocational chassis manufacturers offer a narrow set of products that are very custom to a specific application and that they have very low sales volumes. These manufacturers have limited ability to take advantage of an averaging credit program and have limited resources for recordkeeping and reporting.

### **9.5.3 Suggested Flexibilities**

The Panel recommends interim reduced requirements for these small manufacturers with stringencies that include technologies that fit the applications of these vehicles.

#### *9.5.3.1 Emergency Vehicles*

One of the vocational chassis SERs was a fire truck manufacturer. Fire trucks, and many other emergency vehicles, are built for high level of performance and reliability in severe-duty applications. Some of the CO<sub>2</sub>-reducing technologies listed in the materials could compromise the

fire truck's ability to perform its duties and many of the other technologies simply provide no benefit in real-world emergency applications. The Panel recommends proposing less stringent standards for emergency vehicle chassis manufactured by small businesses. The Panel believes it is feasible for small manufacturers to install a Phase 2-compliant engine, but recommends EPA request comment on whether the use of LLR tires will provide enough CO<sub>2</sub> benefits to justify requiring small business emergency chassis manufacturers to adopt them. In addition, the Panel recommends a simplified certification approach for small manufacturers who make chassis for emergency vehicles that reduces the number of inputs these manufacturers must obtain for GEM. Emergency vehicles make up less than one percent of the annual vocational vehicles sold, and the Panel anticipates these reduced requirements would have a minimal impact on the overall CO<sub>2</sub> reductions of the program.

#### *9.5.3.2 Off-Road Vocational Vehicles*

EPA is planning to propose to continue the exemptions in Phase 1 for off-road and low-speed vocational vehicles (see generally 76 FR 57175). These provisions currently apply for vehicles that are defined as "motor vehicles" per 40 CFR 85.1703, but may conduct most of their operations off-road. Vehicles qualifying under these provisions must comply with the applicable engine standard, but would not need to comply with a vehicle-level GHG standard. The Panel believes this exemption is sufficient to cover the small business chassis manufacturers who design chassis for off-road vocational vehicles.

#### *9.5.3.3 Custom Chassis Manufacturers*

The second vocational SER manufactures chassis for specialty operations and that SER has very small annual sales volumes. He provided a summary of his products that indicate his company has a limited ability to adopt many of the technologies described in the materials. The Panel recommends proposing a low volume exemption based on the volume of sales. Similar to the recommendation for emergency vehicle chassis manufacturers, the Panel believes it is feasible to require installation of a Phase 2-compliant engine and recommends that EPA request comment on the benefits of LRR tires in this market segment. At this time, the Panel doesn't have enough information to recommend a sales volume, but recommends that EPA request comment on how to design a small business exemption by means of a volume exemption and what sales volume would be an appropriate threshold.

#### *9.5.3.4 Glider Manufacturers*

The Panel recognizes that EPA would like to reduce the use of glider kits, which have higher emissions of criteria pollutants like NO<sub>x</sub> than current engines, and which could have higher GHG emissions than Phase 2 engines. However, the Panel believes that the number of vehicles produced by these small businesses is too small to have a substantial impact on the total heavy-duty inventory. The Panel also believes that there should be an allowance to produce some number of glider kits for legitimate purposes, such as for newer vehicles badly damaged in crashes. The Panel therefore recommends proposing an explicit allowance for existing small businesses to continue assembling glider vehicles without having to comply with the GHG requirements. The Panel recommends that

any other limitations on glider production be flexible enough to allow sales levels as high as the peak levels in the 2010-2012 timeframe.